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to the "History of Vegetable Anatomy," and the third to the "History of Vegetable Physiology." In treating these topics, the author says in his preface to the English edition: "I purposed to present to the reader a picture of the way in which the first beginnings of scientific study of the vegetable world in the sixteenth century made their appearance in alliance with the culture prevailing at the time, and how gradually, by the intellectual efforts of gifted men, who at first did not even bear the name of botanists, an ever-deepening insight was obtained into the relationship of all plants, one to another, into their outer form and inner organization, and into the vital phenomena or physiological processes dependent on these conditions."

In this preface several sentences attract the attention of the reader. For example: "I would desire that whoever reads what I have written on Charles Darwin in the present work should consider that it contains a large infusion of youthful enthusiasm, still remaining from the year 1859, when the 'Origin of Species' delivered us from the unlucky dogma of constancy. Darwin's later writings have not inspired me with like feeling. So has it been with regard to Nägeli."—CHARLES E. BESSEY.

Photographs of Dr. Parry.—I feel certain that I am obliging many botanists by stating that good photographs of the late Dr. C. C. Parry, the well-known botanist, may be obtained of Jarvis White & Co., of Davenport, Iowa, for twenty-five cents each. Wishing to place such a photograph in my gallery of botanists, I made inquiries, with the result given.—CHARLES E. BESSEY.

ZOOLOGY.

A New Actinian.—Dr. H. V. Wilson describes (Studies J. H. Univ., IV., No. 6) a new Actinian from the Bahamas, under the name *Hoplophoria coralligens*. It belongs in the family Antheadæ, and is noticeable from the fact that only six pairs of mesenteries reach the œsophagus, and in the position of four marginal sacs, which are highly developed stinging organs. In regard to Hertwig's suggestion that possibly the Madreporarian corals are a heterogeneous assortment of hexactinian polyps, which have independently acquired a skeleton. Dr. Wilson drops the hint that the study of the mesenterial filaments affords a negative argument. "Porous and aporous corals alike have simple filaments, but actinian have trifid filaments."

Entozoa of Marine Fishes.—Professor Edwin Linton has published a first paper on these forms, which, though included in the Fish Commission Report for 1886, did not appear until 1889. Professor Linton has spent several summers at Wood's Holl collecting the internal parasites of fishes. In the present paper he confines himself to the Cestods and Acanthocephala. Seventeen species in all are enumerated, of which ten are regarded as new, while three new genera are made in the paper. The general distribution of these parasites is summarized thus by Mr. Linton: Cestoid entozoa in the adult or strobile condition were found in great numbers in the alimentary tracts of all the Selachians examined. Encysted forms of the Cestoidea are for the most part confined to the Teleostei, and are found in greatest abundance in the sub-mucous coat of the stomach and intestine, although not infrequently met with in the peritoneum, liver, spleen, ovaries, etc.

A Two-Tailed Earth-Worm.—Some time ago one of my students brought in a specimen of a two-tailed earth-worm. While the literature of the subject is not at present accessible to me, I am under the impression that no such abnormal form has been reported from the United States, although several have been found in other parts of the world. When the animal was alive it seemed really two-tailed, the parts appearing of equal importance, but in the alcoholic specimen one division appears like a lateral branch, and is quite markedly constricted where it joins the body of the worm. Branches of the intestine and ventral nerve cord pass to both divisions, and there are two functional ani. The alcoholic specimen is 34 mm. long, the "tails" being about 12 mm. long.—C. DWIGHT MARSH, *Ripon College.*

Compound Eyes of Arthropods.—Mr. S. Watase has presented (Studies, Biol. Lab., Johns Hopkins, IV., No. 6) an extremely ingenious view of the morphology of the compound arthropod eye. The compound eye is formed by the vegetative repetition of the visual unit or *ommatidium.* In Serolis each ommatidium constists of two *corneagen* cells, which secrete on their outer (free) surface the chitinous cornea. Beneath these come two other cells (*vitrellæ=retinophoræ*), which secrete on the surfaces toward the axis of the ommatidium the chitinous *crystalline* cone, which, according to Watase, is purely dioptric, and has no connection with the optic nerve fibres. Beneath the vitrellæ are the *retinulæ,* cells which have their deeper ends in communication with the optic nerve, while their surfaces toward the axis of the ommatidium secrete a chitinous rod or *rhabdomere.* This structure is therefore to be regarded as a pit of ectoderm the cells of which, like all ectoderm cells, are capable of secreting chitin, and the pit is filled by this secretion. To this scheme can all compound eyes of Crustacea be reduced; with, of course, the addition of pigment cells, etc. In the compound eye of Limulus we have a very ancestral condition. The ectodermal pit remains open, and there is no distinction between cornea and crystalline cone, while the rhabdomeres exist as extremely delicate chitinous rods. "According to this view the compound eyes of Arthropods, either in the sessile or in the stalked forms, are nothing more than a collection of ectodermic pits, whose outer open ends face toward the sources of light, and whose inner ends are connected with the central nervous system by the optic nerve fibres. The cells forming the walls of the pit arrange themselves into three strata, in most cases accompanied by three regional functional differentiations. Grenacher's classification of the compound eyes of insects into 'acone,' 'pseudocone,' and 'eucone' types refers to the condition of the cells and their products in the middle stratum—the vitrellæ. Morphologically, then, the compound eye of an Arthropod is strictly single-layered, although, as is evident, the present conception is entirely different from the monostichous theory maintained by some recent writers." Mr. Watase further describes the development of the compound eye of Limulus, and inserts as an appendix some observations on the eyes of starfishes, which, as he shows, can be reduced to the type described among the Arthropods—a pit of ectoderm, the cells of which secrete a cuticle upon their free ends.

Tortoises Sold in the Markets of Philadelphia.—The taste for "stewed terrapin" and "snapper soup" has become so general in Philadelphia, that the United States are now ransacked for the means of supplying it. Within a few years the species sold were the "terrapin," *Malacoclemmys palustris;* the "red-belly," *Chelopus insculptus;* the "slider," *Chrysemys rugosa;* and the "snapper," *Chelydra serpentina.* Now large invoices of turtles are sent from Mobile, New Orleans, and St. Louis, which include the following species: *Chrysemys bellii, C. elegans, C. concinna,* and *C. troostii; Malacoclemmys geographica,* and *M. leseurii;* total, exclusive of sea turtles, ten species. All are abundant in the market except the *C. bellii.*—E. D. COPE.

Zoological News.—**Vermes.**—Beddard (Proc. Zoöl. Socy., London, 1889) catalogues the Oligochætes of New Zealand, enumerating fourteen species. His conclusions of the relationships of the fauna to that of Australia are: The Olighcoætous fauna of New Zealand differs markedly from that of Australia, in which the characteristsc genera, represented by numerous species, are Megascolides, Perichæta, and Cryptodrilus. The characteristic New Zealand form is evidently Acanthodrilus, while Perichæta is represented by but few species.

Arthropods.—Benham thinks that the structures found in a New Zealand earth-worm (*Acanthodrilus multiparvus*) throw light upon the possible origin of the Malpighian tubules in the Arthropoda. In this worm minute cæcal diverticula arise from the (? hind) gut, but a little farther forward similar tubules become continuous with undoubted nephridia. These are certainly comparable to the anal nephridia of the Gephyrea, and in order to convert them into Malpighian tubules is to limit their number and arrange them in regular order, their inner ends being closed.

Fishes.—Jordan & Fisher describe as new (Proc. Acad. Nat. Sci. Philadelphia, 1889) *Orthopristis lethopristis* from the Galapagos Islands.

Meek and Bollman describe (*l. c.*) two specimens of *Elegatis bipinnulatus* Bennett, taken off Long Island, N. Y., the first occurrence of the species in the waters of the United States.

Willard Morrison (*l. c.*) reviews the American species of Priacanthidæ. He regards the family as an offshoot of the Serranidæ, and recognizes two genera—*Priacanthus* with the species *catafula*, *crentatus* and *bonariensis*, and *Pseudopriacanthus* with a single species, *altus*.

Ph. Kirsch and Morton Fordice (*l. c.*) review the American Sturgeons. The species recognized are *Scaphirhynchus platyrhynchus* and *Acipenser sturio*, *medirostris*, *rubicundus*, *brevirostrum* and *transmontanus*.

Ph. Kirsch (*l. c.*) recognizes the following species of Uranoscopidæ in Europe and America: *Kathetostoma averruncus*, *Uranoscopus scaber*, *Astroscopus anoplos*, *Upsilonophorus Y-græcum*, *U. guttatus*.

Birds.—Beddard (*Ibis*, Jan., 1890) describes the alimentary canal of the Martineta Tinamou (*Calodromas elegans.*) The cæca differ from those of all other Crypturi, being furnished with numerous small diverticula, giving the inner surface an appearance not unlike the ventriculum of a ruminant's stomach.

Witmer Stone shows (Proc. Acad. Nat. Sci. Philadelphia, 1889,) that Sharpe has mistaken Verreaux's *Pratincola salax*, and that it is identical with *P. sybilla* Linne. *P. axillaris* Shelly may be a variety of the same.

Mammals.—Ryder (Proc. Am. Philos. Soc., XXVI., 1889) seeks the phylogeny of the mammalian sweat gland in the epidermal glands of the Batrachia. C. Hart Merriam (*North American Fauna*, No. 1; pubished by the U. S. Department of Agriculture) presents a revision of the North American pocket mice. With abundant material, he has recognized eighteen species, but has united the two genera Perognathus and Cricetodipus. Many changes in synonymy are noticeable. In a second paper (l. c., No. 2) the same author describes fourteen new species of mammals from North America, arranged in the genera Onychomys, Arctomys, Lagomys, Spermophilus, Tamias, Nyctionomus, and Phenacomys (nov.).

Beddard (Proc. Zoöl. Soc., London, 1889) describes the visceral anatomy and brains of the American tapir. He concludes that the American species is distinguished from the Indian by the absence of well marked valvulæ conniventes, the presence of a moderator band in the heart, the shape of the glans penis, and a more elongate cæcum sacculated by four bands. The cerebral convolutions are simpler in Tapirus than in other living Perissodactyles.

Dr. R. W. Shufeldt describes (Proc. Acad. Nat. Sci., Philadelphia, 1889) the skull in an embryonic specimen of the California wood-rat, *Neotoma fuscipes*.

Dr. Frank C. Baker describes (l. c.) the habits of the recently discovered round-tailed muskrat, *Neofiber alleni* True.

EMBRYOLOGY.

The Placentation of the Hedge-hog (*Erinaceus europaeus*), and the Phylogeny of the Placenta.[1]—Prof. A. A. W. Hubrecht has placed embryological students under great obligations to him for this admirable work upon the development of the hedge-hog. There is room, however, for very wide difference of opinion as to the significance of the facts recorded. While no one will probably be disposed

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[1] *Quar. Jour. Mic. Sci.*, XXX., Pt. 3, 1889, pp. 283-404. Plates XV.-XXVII.